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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,240	06/22/2005	Atsushi Mikado	36856.1348	1630
35510	7590	03/30/2006	EXAMINER	
KEATING & BENNETT, LLP 8180 GREENSBORO DRIVE SUITE 850 MCLEAN, VA 22102			SHAH, SAMIR M	
			ART UNIT	PAPER NUMBER
			2856	

DATE MAILED: 03/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/540,240	MIKADO ET AL.	
	Examiner	Art Unit	
	Samir M. Shah	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-12 and 14 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6/22/2005</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:
2. On page 15, line 7, delete the phrase "one the side" and replace it with -- one side --. On page 18, line 25, it is confusing as to which figure "electrode 4c" is referring to. Is it referring to figures 8-10, which correspond to a different embodiment than the one being explained on page 18? Or is it referring to the first preferred embodiment, in which case, the reference number (4c) is not shown in the appropriate drawings?

Appropriate correction is required.

Claim Objections

3. Claim 1 is objected to because of the following informalities:
4. The phrase "bimorph acceleration-sensor element" is misleading since acceleration sensor element disclosed in the drawings and the written description of the specification by the applicants is not a bimorph structure. By definition, a "bimorph" is a laminate of two piezoelectric thin, flat elements that are glued together over their entire large surfaces (J. G. Smits and W. J. Ossmann, "Piezoelectric Devices"). However, in the applicants' drawings and specification, there is a base plate and space between the two piezoelectric resonators. It is suggested that the applicants either use another word besides "bimorph" to describe the acceleration sensor element or provide a definition for the word "bimorph", consistent with the intended interpretation by the applicants, in the specification.
5. There is no proper antecedent basis for "the fixed end" (2nd last line of the claim).

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 8, 10-12 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Tabota (US patent Application Publication 2002/0047700 A1 henceforth "Tabota").

Note that the term "bimorph" is interpreted in its true meaning as described in the claim objections.

9. As to claim 8, Tabota discloses an acceleration sensor including a base plate/intermediate layer (5), first and second resonators (3 and 4) each including piezoelectric material and each having electrodes (3a, 3b, 4a, 4b) on two opposite main surfaces thereof, each of the first and second resonators having a vibrating section at an intermediate portion of the resonator with respect to the longitudinal direction thereof (paragraph 0031, lines 1-19; and, paragraph 0032, lines 8-11); the first and second resonators (3 and 4) are attached to opposite sides of the base plate/intermediate layer (5) with respect to a direction in which acceleration is applied so as to define a bimorph acceleration-sensor element (2) (paragraph 0031, lines 1-5); one longitudinal end of the

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acceleration-sensor element is fixed such that the first and second resonators (3 and 4) bend in the same direction in response to the acceleration (paragraph 0011, lines 13-17); and changes in frequency or changes in impedance in the first and second resonators (3 and 4) caused by the bending of the acceleration-sensor element (2) are differentially detected in order to detect the acceleration (paragraph 0011, lines 18-23), the acceleration-sensor element (2) is bendable about a central bending plane being positioned at a central portion of the base plate/intermediate portion (5) with respect to the application direction of acceleration (G) (figure 5); and the vibrating section of each of the first and second resonators (3 and 4) is disposed close to a fixed end of the acceleration-sensor element (figures 2, 3 and 5).

10. As to claim 10, Tabota discloses that the first and second resonators (3 and 4) are attached to the opposite sides of the base plate/intermediate portion (5) at positions where the first and second resonators are opposed to each other (figure 3).

11. As to claim 11, Tabota discloses that each of the first and second resonators (3 and 4) is attached to the central portion of the base plate/intermediate portion (5) with respect to a height direction of the base plate/intermediate portion (5), the height direction being substantially perpendicular to the application direction of acceleration (G) (figure 3).

12. As to claim 12, Tabota discloses that the base plate/intermediate portion (5) and the first and second resonators (3 and 4) can be made of at least one material having substantially the same coefficient of thermal expansion (paragraph 0053, lines 1-16).

13. As to claim 14, Tabota discloses that the casing components/members (6 and 6) are provided with a plurality of internal electrodes disposed on upper surfaces of the casing components, the internal electrodes (61, 62 and 63) being connected with the electrodes in each of the first and second resonators (3 and 4) (paragraph 0038, lines 3-4; and figure 1).

14. Claims 8-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Paros et al. (US Patent Publication 2002/0166379 A1 henceforth "Paros").

Note that the term "bimorph" is interpreted in light of the meaning disclosed by the applicants' drawings and specification.

15. As to claim 1, Paros discloses an acceleration sensor including a base plate/fixed base (152b)/proof mass (154b) (column 6, line 52), first and second resonators (158b and 160b) (column 6, lines 53-56) each including piezoelectric material and each having electrodes on two opposite main surfaces thereof (column 7, lines 25-35; column 8, lines 25-35), each of the first and second resonators having a vibrating section at an intermediate portion of the resonator with respect to the longitudinal direction thereof (figures 9A, 9B), wherein the first and second resonators are attached to opposite sides of the base plate/fixed base (152b)/proof mass (154b) with respect to a direction in which acceleration is applied so as to define a bimorph acceleration-sensor element (150b), one longitudinal end of the acceleration-sensor element is fixed such that the first and second resonators bend in the same direction in response to the acceleration (figures 9A, 9B), and changes in frequency or changes in impedance in the first and second resonators caused by the bending of the acceleration-sensor element (150b)

are differentially detected in order to detect the acceleration (column 6, lines 29-36), the acceleration-sensor element (150b) is bendable about a central/neutral bending plane (162b) in response to the acceleration, the central bending plane being positioned at a central portion of the base plate/fixed base (152b)/proof mass (154b) with respect to the application direction of acceleration, and the vibrating section of each of the first and second resonators is disposed close to the fixed end of the acceleration-sensor element (150b) (column 6, lines 61-67; column 7, lines 1-2).

16. As to claim 9, Paros discloses that height of the first and second resonators (158b and 160b) in a direction that is substantially perpendicular to the application direction of acceleration is smaller than height of the base plate/fixed base (152b)/proof mass (154b) in the direction that is substantially perpendicular to the application direction of acceleration (figures 9A, 9B).

17. As to claim 10, Paros discloses that first and second resonators (158b and 160b) are attached to the opposite sides of the base plate/fixed base (152b)/proof mass (154b) at positions where the first and second resonators (158b and 160b) are opposed to each other (figures 9A, 9B).

18. As to claim 11, Paros discloses that each of the first and second resonators (158b and 160b) is attached to the central portion of the base plate with respect to a height direction of the base plate/fixed base (152b)/proof mass (154b), the height direction being substantially perpendicular to the application direction of acceleration (figures 9A, 9B).

Allowable Subject Matter

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19. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to claim 13, note is made of "an extraction electrode provided on the base plate", "a first extraction electrode provided on one of the casing components", "a second extraction electrode provided on the other casing component" in combination with other limitations of the claim. Note is also made of the benefit of "an extraction electrode provided on the base plate", "a first extraction electrode provided on one of the casing components", "a second extraction electrode provided on the other casing component" (page 20, lines 16-20 of the Specification). Reference Tabota discloses all the limitations of claim 13 except for "an extraction electrode provided on the base plate", "a first extraction electrode provided on one of the casing components", "a second extraction electrode provided on the other casing component".

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent Application Publication 2002/0069702 A1 to Tabota.

US Patent 6,546,800 B1 to Namerikawa et al.

US Patent 6,744,181 B1 to Ogiura et al.

US Patent 5,703,295 to Ishida et al.


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21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samir M. Shah whose telephone number is (571) 272-2671. The examiner can normally be reached on Monday-Friday 9:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


SMS


CHARLES GARBER
PRIMARY EXAMINER